CLAIMS

We claim:

1. A method of fabricating an integrated device, the method comprising:

forming a transistor of an integrated device;

forming a first protective layer over the transistor; and

forming a micro-electro-mechanical system (MEMS) structure over the first protective layer, the MEMS structure including a movable element that is formed using a deposition process at a temperature of at least about 700°C.

2. The method of claim 1 wherein the movable element comprises a membrane of a pressure transducer.

3. The method of claim 1 wherein the movable element comprises a membrane of a capacitive micromachined ultrasonic transducer (CMUT).

4. The method of claim 1 wherein the integrated device comprises a diffractive light modulator.

5. The method of claim 1 wherein the integrated device comprises a CMUT.

6. The method of claim 1 wherein the deposition process comprises low-pressure chemical vapor deposition (LPCVD).

7. The method of claim 1 further comprising:

suspending the movable element over a bottom electrode.

8. The method of claim 7 wherein the bottom electrode comprises doped polysilicon.

9. A method of fabricating an integrated device, the method comprising:

forming a plurality of transistors of an integrated device;

forming a capacitive micromachined ultrasonic transducer (CMUT), the CMUT including a membrane that is formed using a high temperature process, the plurality of transistors and the CMUT being formed on a same substrate; and

forming an interconnect line electrically coupling the CMUT and a transistor in the plurality of transistors.

10. The method of claim 9 wherein the membrane is suspended over a gap.

11. The method of claim 9 wherein the high temperature process is performed at a temperature of at least about 700°C.

12. The method of claim 9 wherein the high temperature process comprises low pressure chemical vapor deposition (LPCVD).

13. The method of claim 9 wherein the CMUT is formed on a protective layer that is formed over the plurality of transistors.

14. The method of claim 9 further comprising:

exposing the CMUT by etching at least one layer that is formed over the CMUT.

15. The method of claim 9 further comprising:

wiring the CMUT using a low temperature process.

16. The method of claim 15 wherein the low temperature process includes plasma processing.

17. A capacitive micromachined ultrasonic transducer (CMUT), the CMUT comprising:

a transistor under a protective layer;

a bottom electrode over the protective layer; and

a movable membrane over the bottom electrode, the membrane and the bottom electrode being separated by a gap, and wherein the transistor and the membrane are formed on a same substrate.

18. The CMUT of claim 17 wherein the protective layer is between the bottom electrode and the substrate.

19. The CMUT of claim 17 wherein the protective layer comprises an oxide layer.

20. The CMUT of claim 17 wherein the movable membrane comprise high temperature silicon nitride.